

1 2. (amended) The method set forth in claim 1-11 wherein:

2 ~~the messages are part of a transaction;~~

3 ~~the action belongs to the first component's portion of a~~ protocol for

4 ~~ensuring~~ ensures that the results of the transaction are consistent in the components;

5 and

6 in the step of receiving ~~augmented ones~~ an augmented one of the ~~certain~~

7 messages, the information indicating the relevant state indicates whether the

8 transaction will modify data in the other component; ~~and~~

9 ~~in the step of performing the action, the first component optimizes the protocol~~

10 ~~as determined by the retained state.~~

1 3. (amended) The method set forth in claim 2 wherein:

2 the protocol is a two-phase commit protocol;

3 the first component is the coordinator for the protocol; and

4 in the step of ~~performing the action,~~ using the retained relevant state to

5 optimize the protocol the first component sends a message that aborts the transaction

6 to an other component when the other component's retained relevant state indicates

7 that the transaction does not modify the data in the other component.

1 4. The method set forth in claim 3 wherein:

2 the distributed system is a distributed database system and the components are

3 database systems therein.

1 5. (amended) A method of ensuring that a first component of a distributed system

2 that ~~normally accesses~~ exchanges messages that belong to a protocol for a transaction

3 ~~and that are received from~~ with one or more other components ~~thereof of the~~
4 distributed system is additionally aware of a state of ~~one or more of the~~ other
5 ~~components~~ component, the state being relevant to the protocol and that is relevant to
6 ~~the transaction;~~

7 the method comprising the steps practiced in the other component of:

8 determining the relevant state; and

9 ~~augmenting certain of the messages~~ a message sent ~~in the course of the~~
10 ~~transaction~~ according to the protocol with state information indicating the relevant
11 state of the other component,

12 the first component ~~determining an action to be taken with regard to the transaction~~
13 ~~from the state information~~ using the state information to optimize the protocol.

1 6. The method set forth in claim 5 wherein:

2 the relevant state indicates whether the transaction will modify data in the
3 other component.

1 7. The method set forth in claim 6 wherein:

2 the protocol is a two-phase commit protocol; and

3 the other component receives an abort message of the protocol when the
4 relevant state indicates that the transaction will not modify the data in the other
5 component.

1 8. The method set forth in claim 7 wherein:

2 the distributed system is a distributed database system and the components are
3 database systems therein.

1 9. (amended) A method of executing a two-phase commit protocol for a transaction,
2 the transaction involving a coordinator and a cohort and
3 the method comprising the steps performed in the coordinator of:

4 receiving a message ~~required for the transaction~~ of the protocol from the
5 cohort, the message being augmented with state information indicating whether the
6 transaction modifies the cohort's data;

7 retaining the state information for the cohort; and

8 if the state information for the cohort indicates that the transaction does not
9 modify the ~~cohort~~ cohort's data, sending an abort message of the two-phase commit
10 protocol to the cohort.

1 10. A method of executing a two-phase commit protocol for a transaction, the
2 transaction involving a coordinator and a cohort and
3 the method comprising the steps performed in the cohort of:

4 augmenting a message that the cohort sends to the coordinator as part of the
5 ~~transaction~~ protocol with state information indicating whether the transaction will
6 modify the cohort; and

7 responding to messages received from the coordinator as required by the
8 commit protocol,

9 the coordinator sending a message of the commit protocol to the cohort as determined
10 by the state information.

1 11. (new) A method of ensuring that a first component of a distributed system that
2 exchanges messages belonging to a protocol for a transaction with one or more other

3 components of the distributed system is additionally aware of a state of an other
4 component, the state being is relevant to the protocol and
5 the method comprising the steps practiced in the first component of:

6 receiving an augmented one of the messages, the augmented message having
7 been augmented by the other component to additionally contain information
8 indicating the relevant state of the other component;

9 retaining the relevant state from the augmented message; and

10 using the retained relevant state to optimize the protocol.

1 **12. (new)** A data storage device, characterized in that:

2 the data storage device contains code which, when executed by a processor, performs
3 the method of claim 11.

1 **13. (new)** A data storage device, characterized in that:

2 the data storage device contains code which, when executed by a processor, performs
3 the method of claim 2.

1 **14. (new)** A data storage device, characterized in that:

2 the data storage device contains code which, when executed by a processor, performs
3 the method of claim 3.

1 **15. (new)** A data storage device, characterized in that:

2 the data storage device contains code which, when executed by a processor, performs
3 the method of claim 4.

1 16. (new) A data storage device, characterized in that:
2 the data storage device contains code which, when executed by a processor, performs
3 the method of claim 5.

1 17. (new) A data storage device, characterized in that:
2 the data storage device contains code which, when executed by a processor, performs
3 the method of claim 6.

1 18. (new) A data storage device, characterized in that:
2 the data storage device contains code which, when executed by a processor, performs
3 the method of claim 7.

1 19. (new) A data storage device, characterized in that:
2 the data storage device contains code which, when executed by a processor, performs
3 the method of claim 8.

1 20. (new) A data storage device, characterized in that:
2 the data storage device contains code which, when executed by a processor, performs
3 the method of claim 9.

1 21. (new) A data storage device, characterized in that:
2 the data storage device contains code which, when executed by a processor, performs
3 the method of claim 10.

22. (new) A coordinator in a distributed system that coordinates a protocol for a transaction that involves one or more other components of the distributed system by exchanging messages of the protocol with the other components, the coordinator having the improvement comprising:

retained state information that retains state of an other component that is relevant to the protocol,

the coordinator receiving a message of the protocol from the other component which has been augmented with the state information, retaining the state information from the augmented message in the retained state information, and using the retained state information to optimize the protocol.

23. (new) The coordinator set forth in claim 22 wherein:

the protocol ensures that the results of the transaction are consistent in the components; and

the retained state information for the other component indicates whether the transaction will modify data in the other component.

24. (new) The coordinator set forth in claim 23 wherein:

the protocol is a two-phase commit protocol; and

the coordinator sends a message of the protocol that aborts the transaction to an other component when the other component's retained state indicates that the transaction does not modify the data in the other component.

25. (new) The coordinator set forth in claim 24 wherein:

the distributed system is a distributed database system and the coordinator and the other component are database systems therein.

26. (new) A cohort in a distributed system, the cohort being involved in a transaction coordinated according to a protocol by a coordinator and exchanging messages of the protocol with the coordinator,

the cohort having the improvement comprising:

5 a message of the protocol that is augmented with state information indicating a
6 state of the cohort which is relevant to the protocol,
7 the cohort sending the message to the coordinator and the coordinator retaining the
8 state information and using the retained state information to optimize the protocol.

1 **27. (new)** The cohort set forth in claim 26 wherein:

2 the protocol ensures that the results of the transaction are consistent in the
3 components; and

4 the state information in the augmented message indicates whether the
5 transaction will modify data in the cohort.

1 **28. (new)** The cohort set forth in claim 27 wherein:

2 the protocol is a two-phase commit protocol; and

3 the coordinator sends a message of the protocol that aborts the transaction to
4 the cohort when the retained state information for the cohort indicates that the
5 transaction does not modify the data in the cohort.

1 **29. (new)** The cohort set forth in claim 28 wherein:

2 the distributed system is a distributed database system and the cohort and
3 coordinator are database systems therein.

1 **30. (new)** A coordinator in a distributed system that coordinates a transaction that is
2 performed according to a two-phase commit protocol and involves one or more
3 cohorts in the distributed system,

4 the coordinator having the improvement comprising:

5 retained state information that retains state of a cohort, the state indicating
6 whether the transaction will modify the cohort's data,

7 the coordinator receiving a message of the protocol from the cohort which has been
8 augmented with the state information, retaining the state information from the
9 augmented message in the retained state information, and if the retained state
10 information for the cohort indicates that the transaction does not modify the cohort's
11 data, sending an abort message of the two-phase commit protocol to the cohort.

69

1 **31. (new)** A cohort in a distributed system in which a coordinator in the distributed
2 system coordinates a transaction that is performed according to a two-phase commit
3 protocol and involves the cohort,
4 the cohort having the improvement comprising:
5 a message of the protocol that is augmented with state information indicating
6 whether the transaction will modify the cohort's data,
7 the cohort sending the message to the coordinator and the coordinator retaining the
8 state information and if the retained state information for the cohort indicates that the
9 transaction does not modify the cohort's data, sending an abort message of the two-
10 phase commit protocol to the cohort.